Risk analysis characterization of benzene and demographic factors toward immunoglobulin A

ABSTRACT

BACKGROUND: Research on risk assessment at industrial sites has experienced growth during the end of this year. But in Indonesia, there is still limited research on risk assessment, especially regarding the importance of measuring non-carcinogenic risk assessment in the workplace. Benzene exposure is believed to reduce levels of immunoglobulin A (IgA) in workers. AIM: The purpose of this study was to analyse the relationship between risk quotient (RQ) of non-carcinogenic risk assessment of benzene and demographic factors on IgA levels. MATERIAL AND METHODS: The subjects of the study were shoe craftsmen who were at risk of benzene exposure. The study design was cross-sectional with a total population of 20 workers. Measurement of IgA levels by Immunoturbidimetric Assay with a normal standard of 2-3 mg/ml. Calculation of non-carcinogenic (RQ) risk characteristics with a comparison between risk agent non-carcinogenic intake with RfD or RfC benzene. RESULTS: The majority of the study subjects aged over 45 years and had a working period of ≥ 25 years. There were 2 location points that had a threshold value exceeding the benzene standard (> 0.05 ppm), and 40% of the subjects had decreased IgA levels. Age and working periods had a significant relationship to IgA levels ($p = 0.027$; $p = 0.047$), while benzene and RQ levels did not have a significant relationship with IgA levels ($p = 0.179$; $p = 0.436$). CONCLUSION: Increasing age and working period can reduce IgA levels in the body. Further research is needed on risk assessment, especially on the safe limits of benzene concentration in the workplace to find out how long benzene exposure forms a non-carcinogenic or carcinogenic risk in workers' bodies exposed to benzene.

Keyword: Benzene; Ig-A; Shoe-maker worker; Risk quotient